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**UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF NEW YORK**

REBUTTAL REPORT OF [REDACTED]

November 12, 2021

Securities and Exchange Commission v. Ripple Labs, Inc. et al.
Index No. 1:20-CV-10832-AT

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I. INTRODUCTION

A. QUALIFICATIONS

1. I am a Professor of Finance and the [REDACTED]
[REDACTED] I have also served on the faculty at
[REDACTED], and
[REDACTED] I received a B.A. in Economics from [REDACTED] a M.S.
in Finance from [REDACTED] and my Ph.D. in Finance from [REDACTED]
[REDACTED] I have been teaching investments to undergraduate and Ph.D. students over
the last twenty-four years. I have also taught international finance to undergraduate and MBA
students at [REDACTED] and the [REDACTED] I am a past
President and Vice-President of the [REDACTED] former director
of the [REDACTED] and current
President and former Vice-President of the [REDACTED]

2. My research focuses on forensic finance, with specific interest in [REDACTED]
[REDACTED]
[REDACTED] I have published 30 papers, mostly in the [REDACTED]
[REDACTED]
and have been cited over [REDACTED] according to Google Scholar. In the [REDACTED] my
[REDACTED] on [REDACTED]
was published in [REDACTED] and has been extensively featured in over [REDACTED] media
outlets around the world including Bloomberg, The New York Times, The Wall Street Journal,
and The Financial Times. I have published eleven papers related to international finance, mostly
in top finance journals that deal with various aspects of international financial markets including
currencies. I have also taught International Finance to undergraduate and MBA students for over

10 years, during which I lecture on the many aspects of currencies as they are a central component to studying international finance.

3. [REDACTED]

[REDACTED] I have advised and consulted for the U.S. Department of Justice, the Securities and Exchange Commission, the Commodity Futures Trading Commission, state-level enforcement and regulatory entities, and private parties.

4. My curriculum vitae, attached as Appendix A to this report, provides more details about my educational and professional background and experience, as well as a list of my publications in the last ten years. A list of cases for which I have provided testimony or submitted court-filed expert reports in the past four years is attached as Appendix B. I have been compensated at a rate of \$700 per hour for my personal time and I have been assisted by employees of Integra FEC [REDACTED]. My compensation is not contingent upon the findings of this report or outcome in this or any other matter. The use of “I” in this report includes all analyses of data performed by the staff of Integra FEC under my direction and oversight. My opinions are based on my own understanding of the analysis and results presented in this report.

B. BACKGROUND

5. I have been engaged by the Securities and Exchange Commission (“SEC”) to provide expert testimony in the matter of *Securities and Exchange Commission v. Ripple Labs, Inc., et al.* pending in the United States District Court for the Southern District of New York. On October 4, 2021, I submitted a report to this court titled “Expert Report of [REDACTED] (the “Original Report”), which detailed my analysis demonstrating that Ripple Labs Inc. (“Ripple”), Christian Larsen (“Larsen”), and Bradley Garlinghouse (“Garlinghouse”) (i) took specific steps to

influence XRP prices, (ii) were incentivized to attempt to influence XRP price to maximize proceeds raised from sales of XRP, and (iii) relied on XRP sales to supplement operational expenses in a manner similar to how companies use equity.

6. I have now been asked by the SEC to examine and opine on certain opinions in the Expert Report of Prof. Carol Osler (“Osler Report”) and the Expert Report of Allen Ferrell, Ph.D. (“Ferrell Report”). The specific opinions on which I have been asked by the SEC to opine on are detailed under “Assignment” of each section. I have not been asked to review any other topics in the Osler Report or the Ferrell Report, nor to respond to the opinions expressed in reports of Defendants’ other expert witnesses.¹

C. DOCUMENTS CONSIDERED

7. The documents, data, and other information that I have relied upon as the basis for my opinions are cited in this Report and listed in Appendix C. These include, but are not limited to, Ripple internal communications, Ripple’s quarterly XRP Market Reports, Appendix C from the Expert Report of Peter Adriaens, and academic literature on currency and asset pricing.

8. It is possible that I may review additional new information that may become available later, as well as the reports and depositions of other experts. I reserve the right to supplement my report and analyses based on any additional evidence, including any evidence brought to my attention by the defense, other experts, or obtained through discovery.

¹ While I have not been asked to comment on any opinions from the Expert Report of Peter Adriaens (“Adriaens Report”), this rebuttal report references the “Use Cases” listed in Appendix C of the Adriaens Report as provided by defense counsel.

II. REBUTTAL OF DEFENDANTS' EXPERTS' OPINIONS ON CURRENCY

A. ASSIGNMENT

9. The SEC has asked me to examine opinions in the Osler Report and Ferrell Report pertaining to whether XRP functions as a currency. Specifically, I have been asked to comment on the Osler Report's assertion that "XRP fits the economic definition of a 'currency'"² and the Ferrell Report's assertion that "XRP has the same function as money."³

B. SUMMARY OF OPINIONS

10. Based upon (i) my understanding of the academic literature on currency (ii) my analysis of the nature of XRP usage and (iii) my academic research and expertise in economics and international finance, I conclude that XRP does not fulfill the economic definition of a currency because it does not commonly perform *any* of the three primary functions of a currency according to economists: a medium of exchange, unit of account, and store of value.^{4,5} The facts I have reviewed reflect the following, among others:

- a. Professor Mankiw's *Principles of Economics* specifies that a currency, or money, is "the set of assets in the economy that people **regularly use** to buy goods and services (emphasis added)" and "that are **regularly accepted** by sellers in exchange for goods and services (emphasis added)."⁶ Other leading textbook definitions also concur that

² Expert Report of Carol Osler at 3.

³ Expert Report of Allen Ferrell, Ph.D. at 71.

⁴ The main definition for a currency in this report is the same source cited in both the Osler Report and the Ferrell Report: Mankiw, N., *Principles of Economics*, 8th edition, 2016 at 604-605.

⁵ Throughout this report, I frequently use the present tense as a stylistic preference; however, unless otherwise indicated, my report covers the period from when Ripple began selling XRP in 2013 to the filing of the complaint in this action, December 22, 2020.

⁶ Mankiw, N., *Principles of Economics*, 8th edition, 2016 at 604-605.

a currency, or money, “is anything that is *generally accepted* in payment for goods or services or in the repayment of debts (emphasis added)”⁷ and is “*generally accepted* means of payment (emphasis added).”⁸ A currency has three primary functions in the economy: commonly accepted medium of exchange, unit of account, and store of value.

- b. XRP is not a commonly accepted medium of exchange for the purchase of goods or services nor in processing payments for goods. None of the largest retailers in the U.S. nor the major payment processors accept XRP as a medium of exchange.
- c. XRP does not function as a unit of account because XRP is not generally used to quote the prices and values of goods and services, nor is it used in financial reporting. Even Ripple’s own quarterly XRP Market Reports, which publicly disclosed the amount of XRP that Ripple sold each quarter, quoted Ripple’s sales in U.S. Dollars, not XRP.
- d. XRP is not a reliable or stable store of value. XRP is not suited for such purposes because its price is at least 11 times more volatile than any of the top ten most traded fiat currencies in the world.
- e. The Osler Report makes the erroneous conclusion that “XRP fits the economic definition of a ‘currency’” by pointing to hypothetical or rare use cases while ignoring that currencies must be *regularly* and *generally* used to buy goods and services. The Osler Report identifies rare use cases where XRP “can be” used to pay

⁷ Mishkin, Frederic S. and Serletis, Apostolos. The Economics of Money, Banking and Financial Markets (4th Canadian ed.). Toronto: Pearson Addison Wesley, 2011 at 43.

⁸ Krugman, Paul; Obstfeld, Maurice; Melitz, Marc, International Economics: Theory & Policy, 9th edition, 2012 at 355-356.

for goods and services.⁹ Yet, that something “can be” used as a medium of exchange does not satisfy the economic definition to qualify as a currency. The same authoritative source used by the Osler Report to define a currency, Professor Mankiw’s *Principles of Economics*, specifies that a currency must be “regularly use[d]” and “regularly accepted.”¹⁰ XRP is neither regularly used nor regularly accepted.

- f. Professor Osler also asserts that currencies can be highly volatile and points to the Venezuelan Bolivar. However, currencies like the Bolivar that are poor stores of value can continue to exist as currency because the Venezuelan government requires and designates the Bolivar as legal tender. In contrast, XRP is not designated legal tender nor government-backed like traditional fiat currencies and thus is not required to be accepted as a medium of exchange. Professor Osler also fails to acknowledge that Venezuelans commonly transact goods in other more stable foreign currencies such as the U.S. Dollar even within Venezuela and, in 2020, even Venezuela legalized U.S. Dollar based transactions.¹¹ Moreover, XRP is even more volatile than the Venezuelan Bolivar, further demonstrating its weakness as a potential currency.
- g. The Ferrell Report similarly asserts that XRP “can be” a medium of exchange, “can be” a unit of account, and “can be” a store of value. However, many non-currency assets in the world such as Apple stock or pieces of silver can be exchanged, can be used to express prices, and can be a store of value, but hypotheticals do not make

⁹ Expert Report of Carol Osler at 5.

¹⁰ Mankiw, N., *Principles of Economics*, 8th edition, 2016 at 604-605.

¹¹ Saving, Thomas. Can Cryptocurrencies Successfully Compete in the Money Market?, PERC Policy Study 2102.

them currencies. Even items such as airline miles that can function in a limited capacity to pay for flights are not currencies because they are not *generally accepted* as payment for other goods and services. The reality is that XRP units are not regularly used today because XRP does not perform any of the three traditional functions of currency, and speculating on what “can be” is irrelevant to whether XRP *is actually currently* a commonly accepted medium of exchange, unit of account, and store of value.

C. WHAT IS CURRENCY?

11. The traditional definition used by economists, as according to Professor Mankiw’s Principles of Economics, to define currency, or money, is “the set of assets in the economy that people *regularly use* to buy goods and services from each other (emphasis added)” and “that are *regularly accepted* by sellers in exchange for goods and services (emphasis added).”¹² And Professor Mankiw further describes a currency as serving three primary functions: a commonly accepted medium of exchange, a unit of account, and a store of value.¹³ These same functions, from Professor Mankiw’s Principles of Economics, are also cited in the Osler Report. The Ferrell Report cites a similar definition from Professor Mankiw’s Macroeconomics textbook.¹⁴ This definition of money is consistent across other leading economics textbooks, including by Professors Krugman et al. who define money as a “*generally accepted* means of payment (emphasis added)”¹⁵ and by Professors Mishkin and Serletis who state that money is “anything

¹² Mankiw, N., Principles of Economics, 8th edition, 2016 at 604.

¹³ Mankiw, N., Principles of Economics, 8th edition, 2016 at 604-605.

¹⁴ Expert Report of Allen Ferrell, Ph.D. at 7.

¹⁵ Krugman, Paul; Obstfeld, Maurice; Melitz, Marc, International Economics: Theory & Policy, 9th edition, 2012 at 355.

that is *generally accepted* in payment for goods or services or in the repayment of debts (emphasis added).”¹⁶

12. Interestingly, Professors Osler and Ferrell fail to discuss this particularly important requirement of *regular* or *general* use for an asset to be a “currency” as defined by economists, including Professor Mankiw whom they cite. Additionally, it is important to note that the definition and understanding of a currency by Professor Mankiw dictates that all three functions “*together*” distinguish money from other assets in the economy (emphasis added).^{17,18}

13. Currency functions as a medium of exchange by enabling the exchange of goods and services for consideration between buyers and sellers.¹⁹ One can use U.S. Dollars to purchase common goods like a coffee or services like a haircut. However, if one were to own a share of Apple or GameStop, one would not be able to easily purchase these same goods and services without first exchanging Apple or GameStop stock for U.S. Dollars, or another currency if one were in another country, because stores would *generally* not accept stock as a form of payment. Thus, included in Professor Mankiw’s specification of currency as a medium of exchange is that it is “commonly accepted” since buyers and sellers need to be confident that a given currency can be used to make purchases at other venues.²⁰ As such, even though it might be technically feasible to use Apple stock as a medium of exchange, e.g., to make an in-kind donation to a nonprofit, Apple stock is not currency because it is not commonly accepted by other vendors in the economy.

¹⁶ Mishkin, Frederic S. and Serletis, Apostolos. The Economics of Money, Banking and Financial Markets (4th Canadian ed.). Toronto: Pearson Addison Wesley, 2011 at 43.

¹⁷ Mankiw, N., Principles of Economics, 8th edition, 2016 at 605.

¹⁸ Professors Krugman et al. also states that money serves as a medium of exchange, unit of account, and store of value but that “the most important function of money is to serve as the medium of exchange” and the “second important role is as a unit of account.” In discussing the third role as store of value, Krugman notes that “this attribute is essential for any medium of exchange.” Krugman, Paul; Obstfeld, Maurice; Melitz, Marc, International Economics: Theory & Policy, 9th edition, 2012 at 355.

¹⁹ *ibid.*

²⁰ *ibid.*

In addition, Mankiw specifies that in order for an asset to be used as a medium of exchange, it needs to be transferred from a buyer to a seller: “A medium of exchange is an item that buyers give to sellers when they purchase goods and services... [T]his transfer of money [or currency] from buyer to seller allows the transaction to take place.”²¹

14. Currency also functions as a unit of account to measure the value of goods and services as well as the financial performance of companies or the wealth of a household.²² As a practical matter, a currency’s usefulness as a commonly accepted medium of exchange automatically makes it a *regularly* used unit of account since buyers and sellers must be able to quickly and easily quote the value for goods and services one could purchase with such currency. A unit of account needs to be *regularly* used in order to fulfill the function of a currency. For example, while it is possible to measure the value of a cup of coffee as 0.03 shares of Apple, a plane ticket as 2 shares of Apple, or a house as 2,000 shares of Apple, it is unhelpful to do so because Apple shares are not *regularly* used as a unit of account. On the other hand, a \$4.50 cup of coffee, a \$300 plane ticket and a \$300,000 house can be easily valued because U.S. Dollars, as currency, are a common unit of account.

15. Finally, currency functions as a store of value that can be held for use at a later time.²³ A stable currency like the U.S. Dollar allows for predictable purchasing power that typically does not drastically change over short periods of time. With the example of Apple or GameStop stock that we have used, a vendor might not want to accept GameStop shares for payment because its value could radically change with company news. For example, if a coffee shop has received payment in shares of GameStop and the price of GameStop suddenly declines,

²¹ *ibid.*

²² *ibid.*

²³ *ibid.*

the coffee shop might not have enough funds to pay its employees. Thus, the coffee shop would not use GameStop shares as a store of value because of the associated price volatility. Rather, the coffee shop accepts U.S. Dollars because it can store U.S. Dollars from coffee purchases and use them in the future to pay its employees and suppliers without having to worry about significant short-term price declines.

16. Fiat currency derives value from the backing by the issuer of the fiat note. Fiat currencies are typically backed by the full faith and credit of the government that issues them. Traditional fiat currencies like the U.S. Dollar are typically classified as legal tender and are required by *law* to be accepted as a medium of exchange to settle public or private debt in its country of issuance. At times, certain fiat currencies have historically been incredibly volatile and became a poor store of value or unit account. In these cases of extreme currency volatility such as recently happened in Venezuela, citizens resort to using stable foreign currencies such as the U.S. dollar. The local currency might continue to serve as an official medium of exchange and be used in the country only because it is decreed by the government.

17. Certain digital assets are sometimes called “virtual currencies” or “cryptocurrencies” but whether an asset actually functions as a currency is determined by the test set forth above. With respect to XRP, Ripple’s own CEO, Brad Garlinghouse, has publicly denied that XRP is a currency or functions as a currency because it is not *regularly* used as a medium of exchange. At a Yahoo Finance summit on digital assets on February 7, 2018,²⁴ Garlinghouse stated: “I’m even careful, and I would even encourage journalists of the world to be careful, that I don’t call this cryptocurrency. ***It’s not currency.*** I can’t go to Starbucks or Amazon and use [it]. And you know somebody inevitably [will say], ‘I have one example where I bought something

²⁴ Yahoo Finance All Markets Summit: Crypto, February 7, 2018. <https://www.yahoo.com/news/yahoo-finance-markets-summit-crypto-february-7-2018-223531903.html>.

with a Bitcoin.’ Then, I usually say, ‘Well, did you do a second transaction?’ Like, it’s not actually a currency. These are digital assets (emphasis added).”²⁵

18. Additionally, economists have performed assessments using the same currency framework as Professor Mankiw and found that Bitcoin functions more like a speculative investment than a currency or commonly accepted medium of exchange due to its highly volatile nature.^{26,27} Bitcoin is the largest and most widely traded digital asset with a current total value of \$1.21 trillion.²⁸ At a relatively much smaller total value of \$55.8 billion—or 4.6 percent of outstanding Bitcoin²⁹—it would be farfetched to argue that XRP currently functions as a regularly used medium of exchange when Bitcoin does not function in that way yet, despite wider market recognition and adoption. Furthermore, XRP price is on average twice as volatile as Bitcoin and would serve as an even more unstable store of value.³⁰ I conclude in the following sections that XRP does not function as a currency because it does not perform the three primary functions of a currency.

D. XRP IS NOT A MEDIUM OF EXCHANGE AS DEFINED FOR CURRENCIES

19. As explained in the previous Section II.C, an asset functions as a medium of exchange if it is commonly accepted by sellers in exchange for goods and services. XRP is not commonly accepted as a medium of exchange. Even if it is possible for a vendor to receive XRP

²⁵ YouTube. (2019). BRAD GARLINGHOUSE RIPPLE CEO YAHOO FINANCE INTERVIEW 30 MINUTES, starting at 15:09. Accessed at: <https://youtu.be/pzbJ6e8sdpg?t=909>.

²⁶ Baur, Dirk and Dimpfl, Thomas. (2021). The volatility of Bitcoin and its role as a medium of exchange and a store of value. *Empirical Economics*, vol. 61, issue 5, pp. 2663-2683.

²⁷ Baur, D., Hong, K., and Lee, A. (2017). Bitcoin: Medium of Exchange or Speculative Assets?. *Journal of International Financial Markets, Institutions and Money* 54.

²⁸ CoinMarketCap. Bitcoin Price Data. <https://coinmarketcap.com/currencies/bitcoin/>. Accessed on November 12, 2021.

²⁹ CoinMarketCap. XRP Price Data. <https://coinmarketcap.com/currencies/xrp/>. Accessed on November 12, 2021.

³⁰ Leirvik, Thomas. (2021). Cryptocurrency returns and the volatility of liquidity. *Finance Research Letters*, at Table 1.

as payment for a good or service, a vendor cannot in turn easily use that XRP to buy the typical set of goods and services required to operate her business because XRP is not commonly accepted by most vendors today. To analyze the extent to which XRP is commonly accepted as a medium of exchange, this report reviewed the largest 100 retailers in the U.S., as ranked by 2020 retail sales volume, and documented whether any of these retailers' online platforms accept XRP as a medium of exchange.³¹ This list of retailers includes stores that sell a wide range of everyday goods such as Amazon, Walmart, Best Buy and Home Depot. These 100 retailers represent 60 percent of total U.S. retail sales in 2020,³² and their full list is included in Appendix D. By visiting the online platform of each top 100 retailer and reviewing the payment options accepted to complete a purchase at each retailer, it appears that none of the top 100 retailers directly accept XRP as a form of payment for goods and services.³³

20. Another demonstration that XRP is not commonly accepted as a medium of exchange is that it is not accepted by major credit card processors. Visa, Mastercard, UnionPay, American Express, JCB, and Discover collectively processed 99% of the total worldwide credit card purchase transactions in 2017.³⁴ These credit card processors enable the transmittance and settlement of payment from a buyer to a seller of goods and services. However, as of December

³¹ National Retail Federation. Top 100 Retailers 2021 List. <https://nrf.com/resources/top-retailers/top-100-retailers/top-100-retailers-2021-list>; Although the acceptance of XRP as payment was analysed for retailers at the time of writing of this rebuttal report, there is no reason to believe that circumstances were different between 2013 to 2020 and nothing in Osler's or Ferrell's report suggests otherwise.

³² National Retail Federation. State of Retail. <https://nrf.com/topics/economy/state-retail>; The 60 percent figure is calculated by totalling U.S. sales of the 100 retailers (\$2.43 trillion) in Appendix D and dividing by all 2020 U.S. retail sales (\$4.07 trillion), found in the NRF's State of Retail annual sales growth chart: <https://infogram.com/1pl9yq9p7rvglmfqpv1ryxgljmsz575wwm1>.

³³ Certain payment processors such as BitPay allow the purchase of store gift cards that can later be used at certain retailers in the top 100 list. However, this is not considered a medium of exchange and is further discussed in Section III.GI.A.v.

³⁴ Statista. Distribution of credit card issuers worldwide in 2017, by purchase transactions. <https://www.statista.com/statistics/278970/share-of-purchase-transactions-on-global-credit-cards/>.

22, 2020, none of these credit card processors accepted XRP as a sending or settlement currency.³⁵

Thus, XRP is not commonly accepted as a medium of exchange nor regularly used as a means of payment.

E. XRP IS NOT A STORE OF VALUE AS DEFINED FOR CURRENCIES

21. As discussed in Section II.C, an asset cannot be subject to high volatility and still function as a store of value as defined for currencies. For a currency like the U.S. dollar to function as a store of value, its users must be able to have the reasonable belief that a payment received in such a currency will not gain or lose significant purchasing power over a short period of time.³⁶ An asset used as a store of value that has large price swings could result in economic instability or large loss of wealth for the holder of that asset. Thus, sellers of goods and services are unlikely to accept a currency for payment if its value were known to spike or evaporate immediately.³⁷ Volatile currencies like the Venezuelan Bolivar have lost significant value in recent years.³⁸ While the Bolivar continues to be accepted as a currency in Venezuela as required by law, price volatility has led Venezuelans to adopt more stable currencies like the Euro and U.S. Dollar to purchase basic goods and services.³⁹ In fact, Venezuela legalized U.S. Dollar-based transactions in 2020.⁴⁰

³⁵ As of November 4, 2021, none of the payment processors' websites return a search result that mentions the use of XRP on their processing platforms as a medium of exchange between buyers and vendors:

<https://www.google.com/search?q=site%3Avisa.com+xrp>,
<https://www.google.com/search?q=site%3Amastercard.com+xrp>,
<https://www.google.com/search?q=site%3Aamericanexpress.com+xrp>,
<https://www.google.com/search?q=site%3Adiscover.com+xrp>,
<https://www.google.com/search?q=site%3Aunionpayintl.com+xrp>,
<https://www.google.com/search?q=site%3Ajcb.com+xrp>.

³⁶ Saving, Thomas. Can Cryptocurrencies Successfully Compete in the Money Market?, PERC Policy Study 2102.

³⁷ Krugman, Paul; Obstfeld, Maurice; Melitz, Marc, International Economics: Theory & Policy, 9th edition, 2012 at 356.

³⁸ Xe. Venezuelan Bolívar to US Dollar Exchange Rate Chart.

<https://www.xe.com/currencycharts/?from=VEF&to=USD&view=10Y>.

³⁹ Reuters. In Venezuela's major cities, over 50% of goods are sold in hard currency.

<https://www.reuters.com/article/us-venezuela-economy/in-venezuelas-major-cities-over-50-of-goods-are-sold-in-hard-currency-idUSKCN20K38Q>.

⁴⁰ Saving, Thomas. Can Cryptocurrencies Successfully Compete in the Money Market?, PERC Policy Study 2102.

Hence, high price volatility makes it impractical for a currency to be accepted as a medium of exchange and held as a store of value.

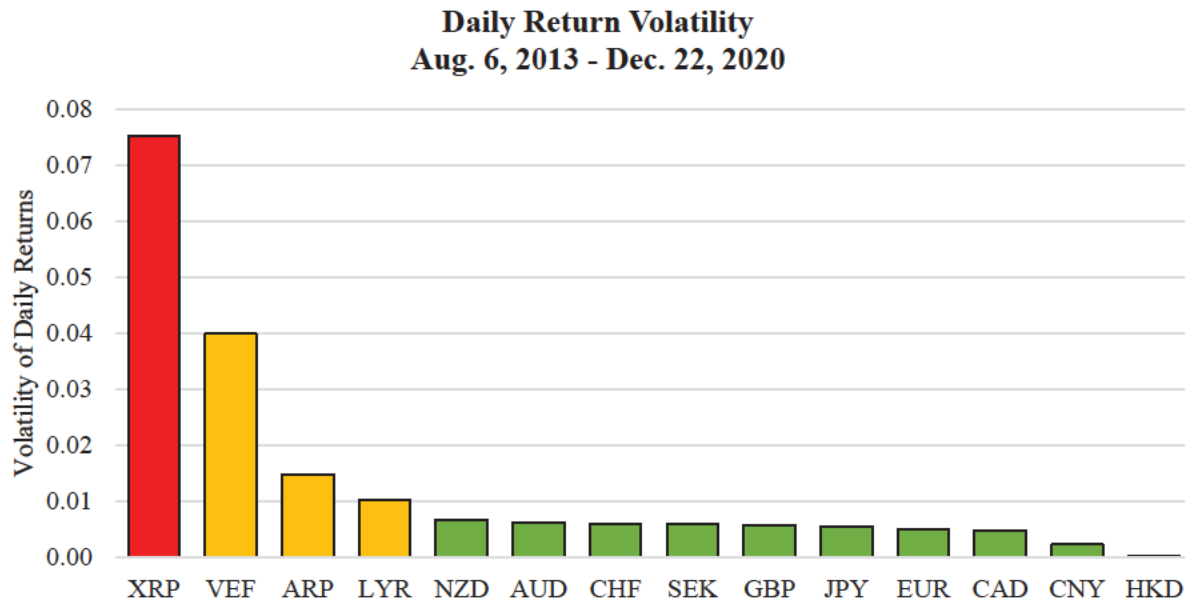
22. To evaluate the extent, if any, to which XRP reasonably functions as a store of value relative to major currencies, this report calculates the daily standard deviation of price returns to quantify the daily volatility of XRP returns compared to the top 10 most traded currencies after the U.S. Dollar, according to the Bank of International Settlements.⁴¹ Comparison of exchange rates are expressed relative to the U.S. Dollar and thus it is not included in the analysis as a separate currency. In addition, historically volatile currencies including the Venezuelan Bolivar, the Argentinean Peso, and the Turkish Lyra are included as comparison.⁴² As shown in Figure 1, between August 6, 2013 and December 22, 2020, XRP has had a daily standard deviation, or volatility, of 7.5 percent. This means that on average, XRP moved 7.5 percent upward or downward per day during the observed time period. Compared to the top 10 currencies (as shown in green bars in Figure 1), XRP is at least 11 to 33 times as volatile. XRP has nearly twice the daily volatility expected from even the volatile Venezuelan Bolivar. The Venezuelan Bolivar is able to continue as a currency because the government can require the currency to be official legal tender, but there is no government that currently requires for XRP to be used as legal tender.

⁴¹ BIS. Foreign exchange turnover in April 2019. https://www.bis.org/statistics/rpfx19_fx.pdf.

⁴² These examples had high periods of instability during the time period examined for XRP and were identified as unstable currencies in the following article: <https://news.bitcoin.com/a-short-history-of-major-fiat-currency-collapses-and-what-triggered-them/>.

Figure 1. Volatility of XRP vs. Fiat Currencies

This graph plots the daily volatility of XRP returns and major fiat currencies. Green bars represent the top 10 most traded currencies, including the New Zealand Dollar (NZD), Australian Dollar (AUD), Swiss Franc (CHF), Swedish Krona (SEK), Pound Sterling (GBP), Japanese Yen (JPY), Euro (EUR), Canadian Dollar (CAD), Chinese Yuan (CNY), and Hong Kong Dollar (HKD). Yellow bars represent examples of volatile fiat currencies including the Venezuelan Bolivar (VEF), Argentinean Peso (ARP), and Turkish Lira (LYR).



23. Additionally, it is important to note that being a good store of value is a necessary but insufficient condition to be a currency. Apple stock is far less volatile than GameStop and also much less volatile than the Venezuelan Bolivar, but that does not make Apple stock a currency without also being a regularly used medium of exchange and unit of account. Professor Mankiw highlights that there are other stores of value, including “*nonmonetary* assets such as stocks and bonds (emphasis added).”⁴³ Nevertheless, the high volatility of XRP makes it an extremely poor store of value today and hence not currently a good candidate as a currency.

F. XRP IS NOT A UNIT OF ACCOUNT AS DEFINED FOR CURRENCIES

24. As described in Section II.C, an asset must be *regularly* used as a unit of account in order to function as currency that provides a useful measure of value. For example, when one

⁴³ Mankiw, N., Principles of Economics, 8th edition, 2016 at 604-605.

visits a restaurant, the prices are quoted in U.S. Dollars, e.g., \$3 for a cup of coffee and \$9 for a sandwich, as opposed to other assets, e.g., 0.014 shares of GameStop for a cup of coffee or 0.041 shares of GameStop for a sandwich. It is obviously feasible to quote prices at the restaurant using shares of GameStop as a unit of account but not at all practical because shares of GameStop are not *regularly* used as a unit of account. Similarly, XRP is not *regularly* used as a unit of account and thus does not function as a currency.

25. Ripple itself does not use XRP as a unit of account. Beginning in Q4 2016, Ripple began to publish quarterly reports that publicly detailed its sales of XRP and the monetary value gained from these sales. As shown in the example in Figure 2, Ripple's sales of XRP were quoted using U.S. Dollars as the unit of account. This form of accounting is unsurprising and in line with generally accepted accounting principles in which U.S. Dollars are much more commonly used as a unit of account. It would not be easy to interpret the monetary gain from Ripple's XRP sales if they were denominated in XRP, both because XRP is not commonly used as a unit of account (it would be difficult for a reader to understand the size of the gain that accrued to Ripple as a result of XRP sales) and also because of the price volatility of XRP (the size of the gain might be substantially different if measured on the date of publication versus the date of sale). However, were XRP a regularly used unit of account, Ripple might have reported its sales in XRP units. Instead, every quarterly report published by Ripple from Q4 2016 to December 22, 2020 did not report Ripple's XRP sales in XRP units, but rather in U.S. Dollars.⁴⁴

⁴⁴ Ripple Insights. Quarterly XRP. Market Reports, 2017-2020. <https://ripple.com/insights/Q4-2016-xrp-markets-report>, <https://ripple.com/insights/Q1-2017-xrp-markets-report>, <https://ripple.com/insights/Q2-2017-xrp-markets-report>, <https://ripple.com/insights/Q3-2017-xrp-markets-report>, <https://ripple.com/insights/Q4-2017-xrp-markets-report>, <https://ripple.com/insights/Q1-2018-xrp-markets-report>, <https://ripple.com/insights/Q2-2018-xrp-markets-report>, <https://ripple.com/insights/Q3-2018-xrp-markets-report>, <https://ripple.com/insights/Q4-2018-xrp-markets-report>, <https://ripple.com/insights/Q1-2019-xrp-markets-report>, <https://ripple.com/insights/Q2-2019-xrp-markets-report>, <https://ripple.com/insights/Q3-2019-xrp-markets-report>, <https://ripple.com/insights/Q4-2019-xrp-markets-report>, <https://ripple.com/insights/Q1-2020-xrp-markets-report>, <https://ripple.com/insights/Q2-2020-xrp-markets-report>

Figure 2. XRP Sales Summary From Q3 2020 XRP Market Report

The table below reports the total XRP sales for Q2 2020 and Q3 2020 as shown in Ripple’s quarterly Q3 2020 Market Report.

Sales Summary (dollars in millions)	Q2 2020	Q3 2020
Total ODL-related sales*	32.55	81.39
Total purchases	0	45.55
Sales (net of purchases)	32.55	35.84

Global XRP volume	Q2 2020	Q3 2020
ADV XRP (dollars in millions)	196.28	403.58
Total XRP volume (dollars in billions)**	17.86	37.13
Net sales as % of total volume	0.18%	0.10%

26. XRP is not regularly used as a unit of account even among the businesses identified by defense counsel that purport to adopt XRP as a payment “use case.” Appendix C of the Adriaens Report provides a list of 660 purported “use cases for XRP or the XRP Ledger” which he identifies as being provided by defense counsel.⁴⁵ Of the 660 purported “use cases”, analysis is performed for all examples that pertain to e-commerce sites involving goods and services and can be accessed as of the date of this report. A list of these 163 examples can be found in Appendix E. Only one of these e-commerce sites, Travala, offers the ability to view prices in XRP units by manually toggling away from the defaulted U.S. Dollar-denominated prices. For example, PrestigeTime, an online e-commerce store listed in Appendix C of the Adriaens Report, specializes in the sale of luxury watches. Watches listed on this e-commerce storefront are quoted exclusively in U.S. dollars. Presumably, this set of businesses identified by Defendants as purportedly employing XRP

report, <https://ripple.com/insights/Q3-2020-xrp-markets-report>, <https://ripple.com/insights/Q4-2020-xrp-markets-report>.

⁴⁵ Expert Report of Peter Adriaens at 64.

“use cases” might be more receptive to using XRP as a unit of account, but U.S. dollars are overwhelmingly used as the unit of account. This is unsurprising, as use of XRP as a unit of account appears to be exceedingly rare. The Osler Report, for example, fails to cite a single example.

G. THE OSLER REPORT MISCHARACTERIZES XRP AS A CURRENCY

27. The Osler Report asserts that “XRP fits the economic definition of a ‘currency’ because it has the functions and attributes commonly assigned to currencies by experts.” Yet, the Osler Report cites limited (and in some cases zero) examples of how XRP fulfills each of the three functions of a currency. The Osler Report also confuses certain *potential* usage of XRP with how it is *actually* used as a digital asset. Moreover, certain attributes as claimed to be shared by XRP are simply not unique or sufficient to deem an asset to be a currency. I describe in the following sections how the Osler Report fails to establish that XRP fits the economic definition of a currency.

i. The Osler Report Fails to Establish that XRP is Regularly Used as a Medium of Exchange

28. As discussed in Section II.C, economic experts assert that a currency must be “commonly accepted” and “regularly use[d]” as a medium of exchange.⁴⁶ The Osler Report speaks to how XRP purportedly can function as a medium of exchange and a means of payment:

Means of payment: Every transaction on the XRP Ledger, including transactions through Ripple’s ODL⁴⁷ product, described in Section IV, costs a fraction of an XRP. That is, XRP is used to pay for the service of liquidity. In addition to that payment for use of the XRP Ledger itself, XRP can be used to pay for physical goods through online platforms including Bitcoin Superstore and Shopify and travel through Travala.⁴⁸

Medium of exchange: One function of XRP is to serve as a medium of exchange between two other currencies and currently serves that function for the client firms using Ripple’s ODL.⁴⁹

⁴⁶ Mankiw, N., Principles of Economics, 8th edition, 2016 at 604-605.

⁴⁷ ODL is an abbreviation for Ripple’s On-Demand Liquidity Product.

⁴⁸ Expert Report of Carol Osler at 5.

⁴⁹ *ibid.*

29. The Osler Report errs in at least five ways when characterizing XRP as a “medium of exchange.” First, “means of payment” is not part of the standard economic definition for a currency—“medium of exchange” is—and this distinction is important.⁵⁰ Professor Osler contradicts herself on whether a “means of payment” is a separate function by asserting “four major functions”⁵¹ while acknowledging that “[v]irtually any standard economics textbook will list the same three functions of money.”⁵² A “medium of exchange” refers to *what* can be exchanged for goods and services while a “means of payment” refers to *how* such payment can be delivered. Thus, U.S. Dollars and Euro are currencies (in relevant part because they are mediums of exchange), while checks and money orders are not (because they are only means of payments and not mediums of exchange). Similarly, as discussed in Section II.G.v., even if a purchase of a good or service is paid with XRP, if the seller receives the payment in fiat currency then XRP is not a medium of exchange and therefore is not a currency. For example, one can use airline miles to purchase various goods such as magazine subscriptions or Amazon gift cards. However, even though airline miles are used as a “means of payment,” they are not a “medium of exchange” because the seller of those goods receives fiat dollars and not airline miles. As such, even if XRP can be used to pay for goods and services to vendors who use Shopify, Professor Osler did not show that those vendors actually receive payment in XRP; Shopify enables XRP payments via processors such as BitPay which commonly settle digital asset payments in fiat currency, as discussed in more details in the later Section II.G.v. In the Shopify example, Professor Osler has not analyzed, let alone shown, that XRP is truly used as a medium of exchange between buyers and sellers.

⁵⁰ Yang, Bill. (2007). What is (Not) Money? Medium of Exchange ≠ Means of Payment. *The American Economist*, vol. 51, issue 2, pp. 101-104.

⁵¹ Expert Report of Carol Osler at 9.

⁵² Expert Report of Carol Osler at 5.

30. Second, the fee or “fraction of an XRP” used to “pay for the service of liquidity” for transfers on the XRP Ledger does not fit the definition of a medium of exchange. According to the standard understanding of this phrase, a buyer gives money in exchange for goods and services from the seller and in exchange for providing goods and services, the seller receives the money as consideration. While a sender of XRP does pay a transaction fee in XRP on the ledger, the XRP paid as transaction cost is permanently destroyed on the network.⁵³ The XRP fee is not paid as consideration to anyone in exchange for the service provided.

31. Third, Professor Osler states “XRP can be used to pay for physical goods through online platforms including Bitcoin Superstore.” However, XRP cannot currently be used at all on Bitcoin SuperStore since this platform no longer has an operating domain as of the date of this report.⁵⁴

32. Fourth, as further discussed in Section II.I, XRP is not a medium of exchange as used in Ripple’s ODL platform. Although Professor Osler makes extensive comparisons of XRP to “cowrie shells,” cowrie shells are not a common currency today even though they could possibly be traded in remote regions or among vacationers at the beach. The sender of fiat in the cross-border transaction pays MoneyGram a transaction fee to facilitate the transfer. This fee is paid in the sender’s local currency. Thus, the medium of exchange that the sender uses to pay to facilitate a transfer to a cross-border recipient is in fiat currency and not in XRP. Additionally, ODL depends on a liquid market for XRP in which Ripple expends significant efforts to incentivize and subsidize, as discussed in more details in the later Section 0 on XRP liquidity.

33. Fifth, the Osler Report did not analyze or demonstrate whether XRP actually is a commonly accepted and regularly used medium of exchange, which is an essential requirement

⁵³ XRP Ledger. Transaction Cost. <https://xrpl.org/transaction-cost.html#beneficiaries-of-the-transaction-cost>.

⁵⁴ The URL for Bitcoin SuperStore, <https://www.bitcoinsuperstore.us/>, was not accessible on November 12, 2021.

for economists to classify an asset as a currency as described in Section II.C. While it may be possible for XRP to be accepted as means of payment by lesser-known sites like Travalat, this is far from the threshold required for a currency to be “commonly accepted” and “regularly use[d]”⁵⁵ as specified in Professor Mankiw’s *Principles of Economics*, which Professor Osler cites. As discussed in Section II.D, XRP cannot be used as a medium of exchange at the largest retailers that are much more representative of the type of transactions in the everyday economy. Professor Osler simply ignores the important distinction that XRP is neither commonly accepted nor regularly used.

ii. The Osler Report Fails to Demonstrate that XRP is Used as a Unit of Account

34. Professor Osler asserts, with no justification or examples, that XRP is used as a unit of account:

*Unit of account: XRP is used to value other things available to exchange.*⁵⁶

35. XRP is very rarely used as a unit of account. Even on online platforms that purportedly accept XRP as payment, almost all prices are quoted in more widely used fiat units such as the U.S. Dollar. XRP is not used to measure economic value or wealth, even by Ripple itself, as shown in Section II.F.

iii. The Osler Report Fails to Establish that XRP is a Stable Store of Value

36. Lastly, Professor Osler asserts that despite its volatile nature, XRP could still be considered a store of value. She cites the volatile nature of fiat legal tender as a comparison:

A wide range of prices between a currency, on the one hand, and goods and services, on the other, is also irrelevant to the nature of that currency. At the time of writing there is substantial uncertainty about US inflation, or equivalently there is concern about the US dollar’s future value in terms of goods and services. No one questions, however, whether

⁵⁵ Mankiw, N., *Principles of Economics*, 8th edition, 2016 at 604-605.

⁵⁶ Expert Report of Carol Osler at 5.

*the US dollar is a currency. Likewise, the rate at which Venezuelan bolivar loses value in terms of goods and services has been extremely difficult to predict in recent years. In 2018, for example, that currency lost 88% of its value in February, 1% in September, and 85% in December. This has no influence on whether the bolivar is a currency.*⁵⁷

37. Professor Osler fails to acknowledge that while the Venezuelan Bolivar is indeed highly volatile, its continued status as a currency is due to its designation as legal tender in Venezuela. As legal tender, the citizens and businesses of Venezuela are required by law to accept the Bolivar to satisfy debts and financial obligations. Nevertheless, even as legal tender, the highly volatile nature of the Bolivar gave way to a black market where more goods and services are bought using more stable foreign currencies than the local currency,⁵⁸ as discussed in Section II.E. Unlike the Bolivar, XRP is neither legal tender nor state-sponsored. Since XRP is not legal tender, there is no legal requirement for sellers of goods and services to regularly accept XRP as payment. Coupled with its highly volatile price as shown in Figure 1, XRP is an unreliable store of value and unsuitable to be used as a currency particularly in circumstances where there is no law mandating that it be accepted as a medium of exchange.

iv. Other Attributes Cited by the Osler Report are not Unique to Currencies

38. In addition to the three primary functions of a currency, Professor Osler also asserts that XRP, like cowrie shells, possesses all seven valuable attributes of a currency as defined by the Federal Reserve and economists.⁵⁹

Durability: Units of XRP do not rot, hold no appeal to animals, and do not tarnish. Portability: Units of XRP are effectively portable insofar as they can be accessed anywhere one finds an internet connection. Divisibility: Units of XRP are divisible because, like Bitcoin, they can be traded in decimal fractions. Uniformity: Unlike a shell, a bead, or a silver coin that must be stamped by a craftsman and will naturally vary slightly, units of XRP are identical by construction. Each XRP comprises precisely 1

⁵⁷ Expert Report of Carol Osler at 6.

⁵⁸ Reuters. In Venezuela's major cities, over 50% of goods are sold in hard currency.

<https://www.reuters.com/article/us-venezuela-economy/in-venezuelas-major-cities-over-50-of-goods-are-sold-in-hard-currency-idUSKCN20K38Q>.

⁵⁹ Expert Report of Carol Osler at 6.

*million drops, the smallest sub-unit. Acceptability: **XRP** can be traded on myriad exchanges around the world. Low storage costs: **XRP** is stored in “wallets,” which effectively “cost” 10 XRP (to satisfy a reserve requirement) for on-Ledger electronic repositories and can be stored in hardware wallets that cost roughly the same range as a medium-quality physical wallet: \$50 to \$200.²⁴ Wallet security is high because transaction ledgers are maintained on many independent servers around the world and updated frequently. This means that the underlying record of XRP ownership is robust to physical or electronic disasters. Limited supply: The long-term supply of **XRP** is limited to the 100 billion already in existence. No additional units of XRP can be created without changing the XRP Ledger itself (emphasis added).⁶⁰*

39. However, these attributes are not unique or sufficient to define a currency from a standard economic perspective. These attributes are shared by many other assets such as stocks and bonds in the same manner as the Osler Report describes. For example, Apple shares are divisible since brokerage houses offer customers the ability to buy and sell fractional shares of stock.⁶¹ Apple shares are also uniform as each common share represents the same ownership interest in the company and are interchangeable when buying or selling on an exchange. In fact, as an illustrative point, if “shares of Apple” were to be substituted with minimal stylistic changes into the same paragraph laid out by Professor Osler to describe “units of XRP”, all of these attributes would ring true for Apple shares.

*Durability: **Shares of Apple** do not rot, hold no appeal to animals, and do not tarnish. Portability: **Shares of Apple** are effectively portable insofar as they can be accessed anywhere one finds an internet connection. Divisibility: **Shares of Apple** are divisible because they can be traded in fractional shares. Uniformity: Unlike a shell, a bead, or a silver coin that must be stamped by a craftsman and will naturally vary slightly, **shares of Apple** are identical by construction. Acceptability: **Shares of Apple** can be traded on myriad exchanges around the world. Low storage costs: **Shares of Apple** can be held in online brokerages with zero or minimal maintenance cost. Limited supply: The supply of **Apple shares** is limited.*

40. Thus, shares of Apple, GameStop, or any other publicly traded stock for that matter can fulfill the attribute requirements in *exactly* the same way that Professor Osler demonstrates for

⁶⁰ Expert Report of Carol Osler at 8.

⁶¹ Charles Schwab. Fractional Shares. <https://www.schwab.com/fractional-shares-stock-slices>.

XRP. However, shares of stocks are certainly not currencies but rather securities. This highlights the fallacy in Professor Osler's argument. Whether or not an asset meets Professor Osler's arbitrary attributes, these attributes are not sufficient to classify them as a currency from a standard economic perspective. Instead, a currency must be a regularly and widely accepted a) medium of exchange, b) unit of account, and c) store of value. XRP again fails to meet any of these conditions as shown above.

v. *XRP is not a Medium of Exchange, Even if Certain Payments Can be Made Using XRP via Payment Processors*

41. Digital asset payment processors, such as BitPay, enable customers to purchase goods and services using digital assets at various vendors. For example, as mentioned in the Osler Report, a clothing vender can use Shopify's e-Commerce solution and integrate with BitPay in order to enable customers to pay for its clothing using digital assets such as XRP. In a similar manner to how one can redeem airline miles for flights, the existence of such payment processing solutions allows XRP to be used as a means of payment but it does not make XRP function as a medium of exchange. In order for XRP to be a medium of exchange, the buyer needs to spend XRP *and* the seller needs to receive payment in XRP.⁶² If the seller receives payment in a fiat currency such as U.S. Dollars, XRP is not actually exchanged in the sale.

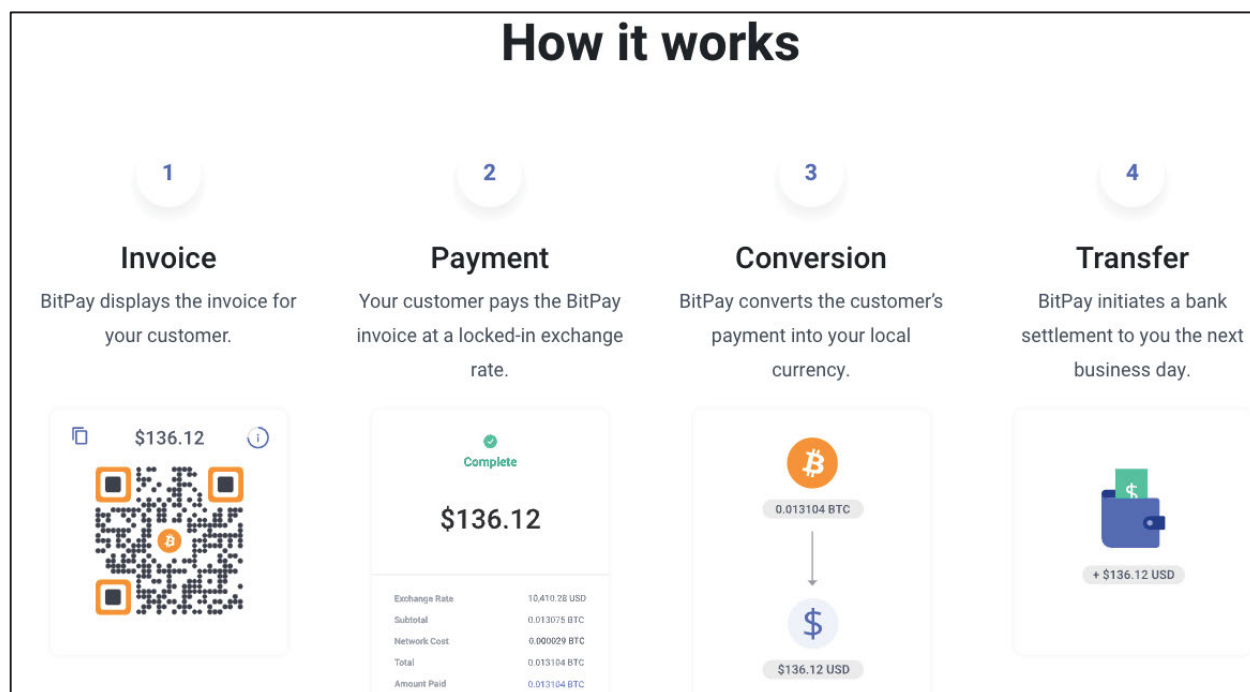
42. At digital payment processors such as BitPay, vendors who receive digital assets as payment are advised to settle in fiat local currency rather than XRP as shown in Figure 3. This makes sense because: (i) XRP is not commonly accepted as a medium of exchange and thus cannot be used by vendors to subsequently buy other goods and services, and (ii) XRP has significant

⁶² Mankiw, N., Principles of Economics, 8th edition, 2016 at 604-605.

price volatility which makes it undesirable for vendors to use XRP as a store of value to make future purchases.

43. BitPay, in recognition of the undesirability for vendors to settle payments in digital assets, promotes the ability for sellers to “Receive funds directly to your bank account with **zero price or volatility risk** (emphasis added).”⁶³ As shown in Figure 3, BitPay’s promoted payment process involves customers paying in a digital asset at a “locked-in exchange rate” (step “2”) followed by vendors receiving funds in their local fiat currency (step “3”). The graphic in Figure 3 indicates that the normal process for vendors using BitPay is to convert digital assets used for payment into fiat currency. Under such a scenario, the digital asset does not function as a medium of exchange since the seller does not actually receive the paid digital asset, e.g., XRP, in exchange for the good or service sold.

Figure 3. Payment Process Promoted by BitPay⁶⁴



⁶³ BitPay. Business. <https://bitpay.com/business/>.

⁶⁴ BitPay. Online Payments. <https://bitpay.com/online-payments/>.

H. THE FERRELL REPORT MISCHARACTERIZES XRP AS HAVING THE SAME FUNCTIONS AS MONEY

44. Similar to the Osler Report, the Ferrell Report argues that “XRP has the same function as money albeit as a virtual currency.”⁶⁵ However, the Ferrell Report similarly fails to demonstrate that XRP exhibits the functions necessary to be classified as a currency. Notably, on several occasions, the Ferrell Report provides examples where XRP “can be” used as one of the functions of a currency. However, “can be” is not the threshold for classification as a currency. Rather, in order for an asset to be classified as a currency, it needs to be *commonly accepted* and *regularly used* as a means of exchange and a unit of account respectively, in addition to having low volatility as a store of value as discussed in Section II.C.

i. *The Ferrell Report Does Not Show that XRP is Commonly Used as a Medium of Exchange*

45. The Ferrell Report provides one use case where XRP “can be” used as a medium of exchange:

*XRP can be used as a medium of exchange in peer-to-peer exchange, for example, between wallets on the blockchain, and can also be exchanged for fiat currency (USD, Euro, Japanese Yen, etc.) or other cryptocurrencies at the cryptocurrency exchanges.*⁶⁶

46. While XRP “can be” used as a medium of exchange in a “peer-to-peer exchange”, the Ferrell Report does not provide any proof that this type of exchange actually happens nor any characterization of the nature of this “peer-to-peer exchange”. For example, this peer-to-peer exchange could involve an over-the-counter trade of XRP as an investment. Furthermore, even if the Ferrell Report envisions such a “peer-to-peer exchange” to involve use of XRP to pay for a good or service, the mere fact that XRP “can be” used in such a transaction is insufficient to

⁶⁵ Expert Report of Allen Ferrell, Ph.D. at 71.

⁶⁶ Expert Report of Allen Ferrell, Ph.D. at 73.

establish XRP as a currency. Currencies need to be regularly used and commonly accepted as a medium for exchange by both buyers and sellers in a market economy, as discussed in Section II.C.

ii. The Ferrell Report Does Not Show that XRP is Commonly Used as a Unit of Account

47. The Ferrell Report cites specific examples of how XRP can be used as a unit of account:

*XRP can be used as a common base to express the price of a unit of XRP on the XRP Ledger but also to express prices at cryptocurrency exchanges.*⁶⁷

48. While the Ferrell Report posits that XRP “can be” used as a common base to express prices, it makes no attempt at analyzing whether XRP *is regularly* used to do so as discussed in Section II.C. Indeed, XRP units are almost never used to quote prices of goods and services. Digital asset prices on the largest digital asset platforms like Binance, Coinbase, and FTX are not regularly expressed in XRP units but rather in fiat currencies such as the U.S. dollar, Euro, or digital stablecoins.⁶⁸ While certainly anything potentially can be used as a common base to express prices, the reality is that XRP units are not used regularly to do so.

iii. The Ferrell Report Does Not Show that XRP is Used as a Store of Value

49. The Ferrell Report claims that former SEC Chair Jay Clayton explained how digital assets can be a store of value:

*In a 2017 speech, then-Chairman of the SEC Jay Clayton explained that cryptocurrencies also serve as a store of value.*⁶⁹

⁶⁷ Expert Report of Allen Ferrell, Ph.D. at 72.

⁶⁸ FTX US. Markets. <https://ftx.us/markets>; Coinbase. All Asset Prices. <https://www.coinbase.com/price>; Binance. Home Page. <https://www.binance.com/en>.

⁶⁹ *ibid.*

50. However, in the subsequent quotation provided in the Ferrell Report, Jay Clayton does not mention that digital assets function as a store of value:

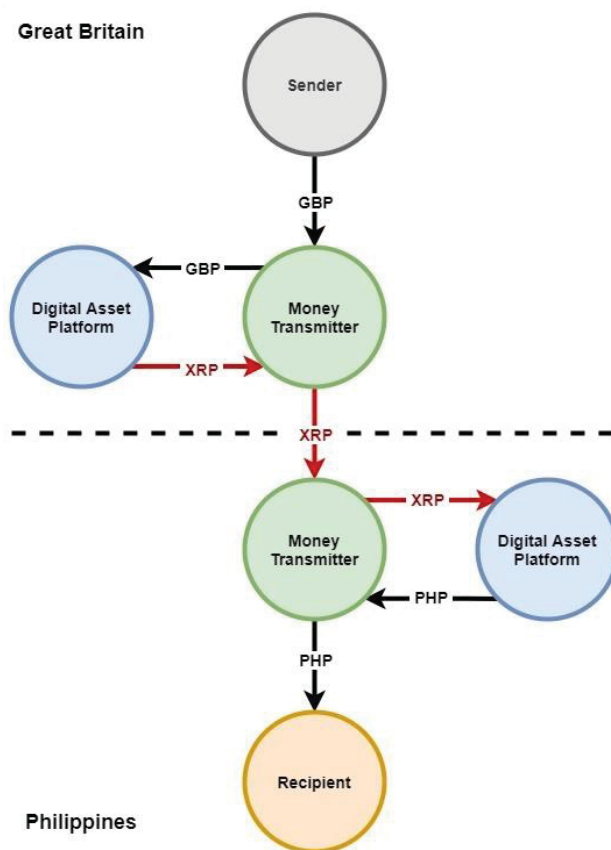
*Cryptocurrencies: Speaking broadly, cryptocurrencies purport to be items of inherent value (similar, for instance, to cash or gold) that are designed to enable purchases, sales, and other financial transactions.*⁷⁰

51. Instead, Clayton only mentions that digital assets “*purport* to be items of inherent value (emphasis added).” As discussed in Section II.C, shares of Apple have inherent value derived from ownership of expected company cashflows, but are not classified as a currency because they are not commonly used as a medium of exchange or unit of account and are a relatively less stable store of value compared to currencies like the U.S. Dollar. Similarly, XRP purports to have value, but cannot be classified as a currency because it is not a widely accepted medium of exchange or unit of account, and XRP’s price volatility precludes it from being a stable store of value.

I. XRP IS NOT USED AS A MEDIUM OF EXCHANGE FOR RIPPLE’S ON-DEMAND LIQUIDITY PRODUCT

52. Both the Osler and Ferrell Report characterizes XRP as a medium of exchange because XRP is used in Ripple’s ODL. ODL uses XRP as a bridge asset to make cross-border payments using the XRP blockchain. Figure 4 provides an illustration of an example cross-border payment using ODL.

⁷⁰ *ibid.*

Figure 4. Illustration of a Transaction on Ripple's On-Demand-Liquidity Platform.

53. The transaction starts in Great Britain where a sender wishes to send a remittance payment to the Philippines. To do so, she uses the services of Azimo, one of the money transmitters that uses Ripple's ODL platform to facilitate cross-border payments. The following steps are taken to send British Pounds (GBP) to the Philippines where it will be received as Philippine Pesos (PHP): (i) the sender sends GBP to the Azimo, (ii) Azimo takes the GBP and trades it for XRP at a European digital asset platform, (iii) Azimo sends the XRP from its account at the European digital asset platform to its account at a Filipino digital asset platform, (iv) at the Filipino digital asset platform, Azimo converts the XRP into PHP, and (v) Azimo pays PHP to the intended recipient.

54. None of the steps in the ODL transaction process described above involve the use of XRP as a medium of exchange. Steps (i) and (v) involve fiat currency. Steps (ii) and (iv) involve a trade between fiat currencies (GBP and PHP) and a digital asset (XRP), but XRP is not actually used as a medium of exchange; it is simply received by Azimo in exchange for GBP and there is no exchange for the purchase of goods or services. In Step (iii) using the XRP ledger, XRP is sent from Azimo's account at the European digital asset platform to its account at the Filipino digital asset platform, and again there is no exchange between a buyer or a seller since there is no change in ownership of the XRP. In addition, the fee paid by the sender to the money transmitter also does not use XRP as a medium of exchange. Money transmittal fees are typically paid in the sending currency, e.g., GBP, but could be deducted from the final payment, e.g., PHP, and certainly would not be paid in XRP. In these transactions, neither the sender nor the receiver ever interface with XRP and thus do not use XRP as a medium of exchange to pay for such a service fee.

III. REBUTTAL OF PROFESSOR FERRELL'S OPINIONS ON RIPPLE'S IMPACT ON XRP PRICE AND LIQUIDITY

A. ASSIGNMENT

55. The SEC has asked me to examine opinions in the Ferrell Report pertaining to the Ferrell Report's dual assertions that (i) "none of [XRP's] returns is owing to the efforts of Ripple"⁷¹ because "Ripple's XRP Distributions Did Not Increase XRP Price Return"⁷² and (ii) "Ripple's efforts over time were concerned with improving market liquidity."⁷³

B. SUMMARY OF OPINIONS

56. Based upon (i) my understanding of the academic literature on liquidity and asset prices, (ii) the Ferrell Report's regression analyses, and (iii) my academic research and expertise in finance, I conclude that the Ferrell Report's conclusion that "none of [XRP's] returns is owing to the efforts of Ripple" is inconsistent with the Ferrell Report's detailing of the steps taken by Ripple to make a liquid market for XRP. The facts I have reviewed reflect the following, among others:

- a. A large body of academic literature finds that increasing liquidity is generally associated with increasing asset price. All else equal, an asset is more valuable when it is more liquid. Stated another way, an investor will pay a higher price for an asset to the extent that the opportunity to sell the asset becomes easier and less costly. In fact, Professor Ferrell, in an earlier expert report for an unrelated matter, conceded that "a more liquid asset will be more valuable than a less liquid asset."⁷⁴

⁷¹ Expert Report of Allen Ferrell, Ph.D. at 55.

⁷² Expert Report of Allen Ferrell, Ph.D. at 51.

⁷³ Expert Report of Allen Ferrell, Ph.D. at 58.

⁷⁴ Report of Allen Ferrell in *James A. Bacon et al. v. Stiefel Laboratories, Inc.*, (No. 09-21 871-KING).

- b. Professor Ferrell asserts that “none of [XRP’s] returns is owing to the efforts of Ripple.” Yet, the Ferrell Report also carefully details the extensive efforts undertaken by Ripple to make a liquid market for XRP. As the academic literature discussed above makes clear, Ripple’s efforts to increase the liquidity of XRP are consistent with increasing XRP price. Indeed, in both public and private communications to their potential investors, Ripple and its employees indicate that they are aware of the positive relationship between liquidity and XRP value. Ripple’s efforts increased liquidity, as Professor Ferrell acknowledged; and increasing liquidity is generally associated with higher prices. Professor Ferrell’s conclusion that “none of [XRP’s] returns is owing to the efforts of Ripple” is directly contradictory to: a) his extensive acknowledgment of Ripple’s efforts to increase liquidity, and b) his acknowledgement that “a more liquid asset will be more valuable than a less liquid asset.”⁷⁵
- c. The empirical regression models that Professor Ferrell estimated to support his assertions that XRP distributions had no impact on XRP prices are both severely flawed conceptually and improperly implemented. Professor Ferrell is purportedly “[f]ollowing the [REDACTED] framework,”⁷⁶ and “implement[s] the [REDACTED] specification”⁷⁷ but errs in implementation. No reliable inferences can be drawn from his analysis.

⁷⁵ Report of Allen Ferrell in *James A. Bacon et al. v. Stiefel Laboratories, Inc.*, (No. 09-21 871-KING).

⁷⁶ Expert Report of Allen Ferrell, Ph.D. at 54 and 55.

⁷⁷ *ibid.*

**C. RIPPLE’S EFFORTS TO INCREASE XRP LIQUIDITY ARE
CONSISTENT WITH INCREASING XRP PRICE**

57. The Ferrell Report asserts that “the SEC fails to consider possible alternative explanations for the economic reality that Ripple’s efforts do not impact XRP prices” and that “XRP’s long-run price returns are owing to non-XRP cryptocurrency market factors; none of those returns is owing to the efforts of Ripple.”⁷⁸ Yet immediately following, Professor Ferrell devoted nearly ten full pages of his report to explain the extensive efforts that Ripple undertook to “facilitate the growth of XRP market liquidity.”⁷⁹ These efforts include contracting with market intermediaries and listing XRP on various digital asset platforms. According to Professor Ferrell, increasing liquidity for XRP through the help of market intermediaries and cross-listings on digital asset platforms would lead to lower transaction costs and make XRP more widely available as a global settlement solution.⁸⁰

58. However, he fails to also acknowledge that the academic literature, internal Ripple communications, and his own prior report in a separate matter clearly support a connection between increasing liquidity and higher XRP prices. Thus, efforts by Ripple to make a liquid market for XRP, as spelled out in the Ferrell Report, are consistent with Ripple exerting effort to increase XRP prices. Notwithstanding the well-established relationship between liquidity and price (as further explained below), Professor Ferrell does not explain or attempt to account for the tension between his opinion that Ripple’s extensive actions had no impact on XRP’s price and his detailed recitation of Ripple’s efforts to increase XRP’s liquidity—efforts that he previously acknowledged have a positive impact on asset price, all else equal.

⁷⁸ Expert Report of Allen Ferrell, Ph.D. at 55.

⁷⁹ Expert Report of Allen Ferrell, Ph.D. at 57-67.

⁸⁰ *ibid.*

59. The Ferrell Report clearly outlined the intent and mechanisms that Ripple implemented to increase market liquidity for XRP. Economists typically define liquidity as the “ease with which an asset can be converted into the economy’s medium of exchange.”⁸¹ Stocks and bonds generally can be sold quickly with low transaction costs and therefore are relatively liquid assets. In contrast, selling a house or art collectible generally requires more effort and thus these assets are considered less liquid.⁸² The Ferrell Report details Ripple’s effort to increase XRP liquidity through two different mechanisms: the first is to pay for the services of wholesale purchasers and market makers to facilitate XRP transactions on over-the-counter (“OTC”) and centralized digital asset platforms and the second is to have XRP listed on digital asset platforms and fund volume incentives for increased platform trading.

60. In the first instance, Ripple expended effort to engage with intermediaries to make XRP trading less costly and more widely available to new purchasers.⁸³ Peer-to-peer trading between wallets on the XRP Ledger is akin to an OTC market. In the absence of a centralized matching system, a buyer must search for a seller, incurring large search costs. To facilitate greater ease of transaction and increase liquidity of XRP, Ripple entered into agreements with wholesale purchasers such as [REDACTED], [REDACTED], [REDACTED] and [REDACTED] to serve as intermediaries for XRP trading.⁸⁴ According to the Ferrell Report, in exchange for a discounted wholesale rate, these firms hold XRP inventory and act as intermediaries to facilitate the trading of XRP through OTC trading desks.⁸⁵ Ripple also contracted with market makers that purport to increase liquidity of XRP on digital asset platforms and the XRP Ledger by filling these platforms’

⁸¹ Mankiw, N., *Principles of Economics*, 8th edition, 2016 at 605.

⁸² *ibid.*

⁸³ Expert Report of Allen Ferrell, Ph.D. at 57-59.

⁸⁴ Expert Report of Allen Ferrell, Ph.D. at 61.

⁸⁵ [REDACTED] and XRP II, *Letter Agreement*, September 18, 2017. (RPLI_SEC_0000861); *Amendment to Letter Agreement*, December 27, 2017. (RPLI_SEC_0000488); [REDACTED] and XRP II, *Master XRP Purchase Agreement*, August 3, 2017. (RPLI_SEC_0000792).

order books with bids and offers.⁸⁶ By paying for the services of these intermediaries, Ripple sought to reduce transaction costs for potential buyers and sellers and make XRP more accessible to new potential buyers.

61. In the second instance, Ripple made efforts to get XRP listed on various new digital asset platforms and enlisted the platforms' efforts to increase XRP trading volume and liquidity. According to the Ferrell Report, Ripple made efforts to have XRP listed on at least seven major digital asset platforms in 2017.⁸⁷ New listings on digital asset platforms help make XRP more accessible for purchase to new buyers across different trading venues and countries. Professor Ferrell further asserts "in an effort to facilitate market liquidity at these cryptocurrency exchanges, Ripple funded volume incentive and trading fee rebate programs at the cryptocurrency exchanges."⁸⁸ Another way to summarize these statements is that Ripple's effort to develop a liquid XRP market by entering into contracts to list XRP on new digital asset platforms is consistent with incentivizing increased trading volume and lowering transaction costs. The impact of this effort is to increase demand—and therefore price—for XRP across a larger investor base.

62. Before discussing the extensive academic evidence on the relationship between liquidity and asset prices, I briefly discuss the basic economic intuition and principles behind market liquidity and its positive price effects. If one could choose to hold either a liquid or illiquid asset, most people will prefer the more liquid asset because it can be more easily converted to cash upon short notice and therefore is more valuable than an asset which cannot be monetized as easily. For two assets that are otherwise identical, a buyer will pay more for the liquid asset. Stated another

⁸⁶ ██████ Market Making Agreement, March 31, 2014. (RPLI_SEC 0947000); ██████ Market Making Agreement, February 7, 2014. (RPLI_SEC 0507336); ██████ and Ripple Payments, Master XRapid Market Maker Agreement, July 29, 2019. (RPLI_SEC 0899563).

⁸⁷ Expert Report of Allen Ferrell, Ph.D. at 63.

⁸⁸ *ibid.*

way, if one can increase an asset's liquidity by making it easier and less costly to buy or sell the asset, it will make the asset more valuable all else being equal. This is the reason why privately held firms whose shares cannot be easily traded are typically valued at a discount relative to firms whose shares can be bought or sold with minimal transaction costs. Increasing liquidity is one of the reasons why firms seek to be publicly listed on stock exchanges and why even after an initial listing, firms often seek additional international listings. This is also a reason why digital assets are often listed on multiple digital asset platforms, as discussed further below.

63. Extensive academic research has shown that increasing asset liquidity tends to lead to higher trading volume, lower transactions costs, and ultimately higher asset prices in traditional financial markets [Amihud and Mendelson (1986), Kadlec and McConnell (1994), Foerster and Karolyi (1999), Miller (1999), Roosenboom and Dijk (2009)]. Foerster and Karolyi (1999) found that cross-listing of securities on new stock exchanges lead to higher asset prices due to exposure to a larger investor base. The positive effect that increasing liquidity has on prices also holds true for digital asset markets. Momtaz (2019) analyzes the performance of digital assets after their initial exchange listings and identifies an average abnormal return of 15% on the first day. Benedetti (2019) analyzes secondary market listings for 3,625 digital assets on 108 marketplaces and observed raw positive cumulative returns of 49% and market-adjusted returns of 16% for a 2-week window around the first cross-listing event. Ante (2019) analyzes 327 secondary platform listings for 180 digital assets and similarly found significant abnormal return of 5.7% on the day of the listing event and 9.2% in the three-day window around the listing date. Listing digital assets on new platforms, and therefore creating new investor bases and increasing liquidity, has an even greater positive effect on prices than in traditional stock markets.

64. Thus, the efforts of Ripple to develop a liquid market for XRP is consistent with efforts to increase XRP value. Ripple's contracts with intermediaries and listings across digital asset platforms are consistent with removing barriers to investment, exposing XRP to new buyers from new markets who can now purchase the asset and help increase XRP visibility. Similar to the investor recognition hypothesis [Merton (1987)], Ripple expands XRP investor base and increases XRP's value by increasing the degree of investor recognition of the project. By introducing new investors to purchase XRP, existing investors can realize profits by selling their holdings to new buyers.

D. RIPPLE AND ITS EXPERT HAVE COMMUNICATED THIS POSITIVE RELATIONSHIP BETWEEN LIQUIDITY AND PRICE

65. In direct contrast to the Ferrell Report's assertion that "Ripple's XRP Distributions Did Not Increase XRP Price Return," Ripple communicated to potential investors that Ripple's XRP distribution strategies would drive demand and have a positive effect on XRP prices. For example, in an email on July 22, 2014 to a potential investor, Phil Rapoport (Ripple's Director of Markets and Trading) references Ripple's distribution strategy published publicly on Ripple's website that states "Our goal in distributing XRP is to incentivize actions that build trust, utility, and *liquidity* in the network...If we distribute XRP with these goals in mind, over time we expect to see *an increase in demand for XRP that more than offsets the additional supply* we inject into the market (emphasis added)."⁸⁹ The distribution strategy outline continues to state that Ripple expects these distributions strategies "to result in a stable or *strengthening XRP exchange rate against other currencies* (emphasis added)." The efforts to increase liquidity that the Ferrell Report extensively detailed (and were explained in the previous section) were dependent on

⁸⁹ Re: XRP Bulk Purchase. ([REDACTED]_Ripple_0002422).

Ripple's XRP distributions to market makers, exchanges, and key participants. As also explained in the previous section, efforts to increase liquidity are associated with an increase in price. Therefore, it should be understood that Ripple's distribution efforts at least in part would be associated with increasing XRP price, or as Ripple puts it "strengthening XRP exchange rate." Indeed, Ripple and its executives communicated this very fact to the public.

66. Public and private communications from Ripple and its executives also highlight this common positive relation between liquidity and prices and that Ripple must exert effort to make XRP markets more liquid. For example, in an internal company email on February 19, 2016, Bob Way (Ripple's Integration Architect) references a study he conducted to analyze XRP's potential to become a bridge asset, and the study acknowledges "XRP's value is tied directly to its liquidity...*XRP becomes more valuable as its liquidity increases* (i.e. instantaneous demand) (emphasis added)."⁹⁰ Mr. Way's study further acknowledges that "increases in volume directly support increases in XRP prices." In addition, this relationship between liquidity and price is also acknowledged by David Schwartz, Ripple's Chief Technology Officer, who publicly states on Twitter, "Liquidity tends to correlate with price..."⁹¹ Additionally, in internal documents discussing the valuation of Ripple, Ripple makes clear that its institutional investors place an illiquidity discount on the company's valuation due to the illiquid nature of its XRP holdings, stating "No matter how it's packaged, an illiquid asset will face a steep discount."⁹² To this end, Ripple is incentivized to increase the liquidity of XRP as it directly benefits its own XRP holdings by increasing XRP prices and making XRP easier for Ripple to monetize by selling XRP to new buyers.

⁹⁰ XRP Bridge Currency Papers. (RPLI_SEC 0364717).

⁹¹ Twitter. David Schwartz. 2018. <https://twitter.com/joelkatz/status/966021274018357253>.

⁹² Proposal to Consider XRP Escrow Schedule. (RPLI_SEC 0754085).

67. Moreover, Ripple’s expert has demonstrated in his own written opinion that liquidity is a key determinant of asset value. An expert report authored by Professor Ferrell for a different matter acknowledges that:

*In analyzing these investment decisions, it is important to recognize that the private value to a participant of illiquid undiversified holdings of Company stock will generally be lower than the fair market value of that Company stock. This follows from basic economic principles. In particular, the value of any financial asset to an individual depends on the risk, expected returns, and liquidity of that asset. All else equal, an asset with higher expected returns will be more valuable than an asset with lower expected returns. Similarly, an asset with lower risk will be more valuable than an asset with higher risk, all else equal. And, **a more liquid asset will be more valuable than a less liquid asset, all else equal** (emphasis added).⁹³*

68. Additionally, Professor Ferrell asserts that “the number of exchanges that list XRP continued to grow even after Ripple stopped their distributions to cryptocurrency exchanges around April 2018” and that “trading and market liquidity at the vast majority of exchanges has **developed organically** (emphasis added).”⁹⁴ This is contrary to Ripple’s own statements as detailed by Mr. Way’s report and moreover, whether or not Ripple actually stopped expending efforts to list XRP on more platforms after April 2018 is tangential. The key point is Ripple’s early efforts to actively manage the liquidity of XRP helped set in motion—in Professor Ferrell’s own words—“a virtuous feedback whereby ‘liquidity demand begets liquidity supply’” and helped attract more market participants to transact in XRP.

69. Consistent with a large body of academic literature on liquidity and asset prices, Ripple’s effort to increase liquidity in the manners detailed by the Ferrell Report would have had the precise effect of increasing XRP transaction volume and demand and therefore, increasing XRP price. Similarly, public and private communications and Professors Ferrell’s previous writing

⁹³ Report of Allen Ferrell in *James A. Bacon et al. v. Stiefel Laboratories, Inc.*, (No. 09-21 871-KING).

⁹⁴ Expert Report of Allen Ferrell, Ph.D. at 65.

indicate that Ripple and its expert agree with the notion that the effort of Ripple to increase liquidity is directly consistent with increasing XRP's price.

E. PROFESSOR FERRELL'S REGRESSION ANALYSIS ON XRP DISTRIBUTIONS AND PRICES IS FLAWED BOTH EMPIRICALLY AND CONCEPTUALLY

70. To empirically demonstrate that "Ripple's efforts do not impact XRP prices", Professor Ferrell erroneously attempts to test whether Ripple's efforts—as measured by XRP distributions—had a statistically significant impact on XRP prices. The Ferrell regression analyzes the rate of XRP distributions against XRP price returns while controlling for market factors and other controls purportedly from my academic paper [REDACTED] [REDACTED]⁹⁵ Professor Ferrell finds no significant statistical relation and thus from this result concludes that XRP long-run price returns cannot be attributed to the efforts of Ripple.⁹⁶ However, Professor Ferrell fails to reconcile the contradictory nature of his conclusion with Ripple's own public and private comments on the relationship between XRP distributions and price as discussed in Section II.D, and indeed no conclusions can be inferred from his analysis because it is flawed for at least five reasons as detailed below.

i. Regression Uses Nonstandard 28-day Event Window

71. The Ferrell Report uses a nonstandard fixed 28-day event window that potentially obscures the timing between trading behavior and price movement. Professor Ferrell examined Ripple's aggregate distributions using a 28-day window instead of the more standard daily or intraday window when dealing with flows. Professor Ferrell states that he is "[F]ollowing the

⁹⁵ The author of this expert report is the same [REDACTED] who [REDACTED] that the Ferrell Report relied upon.

⁹⁶ Expert Report of Allen Ferrell, Ph.D. at 51-55.

framework”, but my academic paper uses intraday data in the empirical analyses. The literature seeking to examine the relationship between asset returns and trading activity typically uses daily or intraday data [(Chordia, Roll, Subrahmanyam (2002), Chordia and Subrahmanyam (2004); [REDACTED] as longer windows will obscure the important timing between returns and trading behavior [Sias, Starks, and Titman (2006)]. Indeed, the major point of a paper by Sias, Starks, and Titman (2006) is that longer windows make it impossible to discern whether the examined trading activity and relationship with a stock price occurs before the price, with the price, or after the price movement.

72. Professor Ferrell cites Fama and French (2015) and Liu and Tsyvinski (2021) who use monthly returns (though they do not deal with flows/distributions like the literature above) but these papers do not use his ad hoc 28-day window approach. Notably, Professor Ferrell cannot cite **any** peer-reviewed academic papers that have implemented his ad-hoc use of an exact 28-day window.

ii. XRP Distributions are Denominated in U.S. Dollars Rather Than XRP Units

73. The Ferrell Report denominates distributions in U.S. Dollars rather than XRP units.

[REDACTED]

Since XRP value has significantly increased during the 2013-2020 period that Professor Ferrell’s analysis encompasses,⁹⁷ denominating XRP distributions in U.S. Dollars assigns heavier weight on distributions in later years when XRP price was relatively much higher and less weight on the earlier years. Conceptually, XRP distributions would likely be more influential relative to price in the earlier time periods when the market for XRP was much smaller and more illiquid. Thus, constructing the series in dollars biases the test against finding a relationship.

⁹⁷ CoinMarketCap. XRP Prices. <https://coinmarketcap.com/currencies/xrp/>.

iii. Regression Analysis Fails to Account for Ripple's Active Management of XRP Distributions

74. An insignificant relationship between XRP returns and XRP distributions, particularly over as long a window as 28 days, might indicate that Ripple was effective in managing XRP distributions, as explained below and in my October 4, 2021 Original Report.⁹⁸ The regression fails to account for Ripple's own actions to time XRP distributions in relation to past prices, which could deliver the exact type of insignificant result that Professor Ferrell purports to find. This type of regression cannot be used to conclude that distributions do not impact returns, because the distributions are not random but timed inversely with past returns.

75. XRP distributions introduce new XRP supply to the market and, all else being equal, would exert downward pressure on XRP price. However, as shown in my Original Report,⁹⁹ internal communications indicate that Ripple and its executives recognized this potential relationship and actively directed market makers to time programmatic sales in relation to how XRP price moves. For example, around an upcoming news announcement, [REDACTED] (VP of Finance) stated to GSR, "We want to keep the bots off for now but expect to make a news announcement on Thursday. If the news has positive impact and price rises, we would like to start selling into that. However, if price is not rising we will want to hold off."¹⁰⁰ In another example, between December 2014 and January 2015, comments found in a GSR historical daily sales report indicate GSR and Ripple coordinated XRP sales in a manner consistent with stopping or reducing sales to mitigate impact when XRP prices were declining.¹⁰¹

⁹⁸ Expert Report of [REDACTED] at 21-26.

⁹⁹ *ibid.*

¹⁰⁰ Email from [REDACTED] June 1, 2016. (GSR00004438).

¹⁰¹ Excel Export - 2014-2016 - 2t - Liquidity extraction report. (RPLI_SEC 0679467-467).

76. As explained in my Original Report, Ripple also directed purchases of XRP which the Ferrell regression fails to measure. This is an additional reason why the approach of using XRP distributions is incomplete and incorrect.

77. My Original Report also conducted a formal regression analysis that found from January 2015 to at least September 2019 certain market makers including [REDACTED] and [REDACTED]—consistent with directives from Ripple—tended to sell less when prices were falling and to sell more when prices were stabilized or rising.¹⁰² Ripple is incentivized to closely monitor XRP prices in order to maintain high or stable XRP prices and avoid large sell-offs that would devalue their own XRP holdings. Thus, conceptually, given that XRP sales were related to past prices and this relationship is not accounted for in the regressions, it is not clear what one could learn from the Ferrell Report’s analysis even if were performed in a meaningful manner.

iv. Timing of XRP Transfers May Not Be Consistent with Sales of XRP

78. The Ferrell Report defines the timing of an XRP distribution as occurring on the date when XRP is first transferred out from the Ripple Escrow and other Ripple accounts.¹⁰³ This is another point where Professor Ferrell fails to properly apply the methodology of [REDACTED] [REDACTED] which he purportedly “implement[s].”¹⁰⁴ The date of the XRP distribution as defined by Ferrell does not necessarily serve as a proxy for the exact timing of when XRP is sold to the public on digital asset platforms, which is the timing used by [REDACTED] This distinction is important because the Ferrell regressions calculate XRP returns using digital asset

¹⁰² Expert Report of [REDACTED] at 24-26.

¹⁰³ “The date of each distribution in the data is calculated as follows. For transfers involving Ripple’s Main Balance [consisting of Ripple Escrow and other Ripple accounts], the date on which the transfer occurred is used. For transfers and adjustments (further discussed below) missing an exact date, the first date of the month on which the distributions occurred is used. For transfers involving a Reserved or Custody account, the date on which the transfer first occurred is used.” Expert Report of Allen Ferrell, Ph.D. at C-7.

¹⁰⁴ Expert Report of Allen Ferrell, Ph.D. At 54.

platform prices sourced from CryptoCompare.¹⁰⁵ For example, according to Professor Ferrell, an XRP distribution could be a transfer from the Escrow to a Custody account used to administratively hold funds on behalf of another entity.¹⁰⁶ If a Custody account is not associated with a digital asset platform (and Professor Ferrell provides no evidence of such), it would be implausible to expect an XRP distribution to have any impact on XRP prices on digital asset platform since these distributions have yet to be sold to the general public.

v. *The Ferrell Regression Analysis Does Not Account for the Long-run Effect that XRP Distributions Have on Increased Liquidity, Recognition, and Demand*

79. The Ferrell regression analysis is not designed to properly assess the long-run effect of XRP distributions on demand and therefore, prices. The effect of increasing liquidity on investor demand, which would impact prices, need not happen instantaneously or in the short-term as acknowledged by Ripple. Indeed, as Professor Ferrell noted in his report, “[i]t takes time to develop a liquid market on a particular platform or for a particular asset.”¹⁰⁷ For example, distributing XRP units by selling into the market might have an immediate short-term negative effect on prices due to the increased supply, but in the long-run might increase demand for the asset—and therefore its price—by growing the investor base and recognition and making XRP more familiar to investors. There is a large body of literature demonstrating that investors purchase stocks with which they are more familiar [Huberman (2001) and Grinblatt and Keloharju (2001)], buy and sell stocks they already own [Frazzini and Lamont (2008)], and buy relatively more stocks with increased recognition and visibility [Gervais, Kaniel, and Mingelgrin (2001) and Grullon, Kanatas, and Weston (2004)]. Thus, distributing XRP into the hands of more holders should have a positive

¹⁰⁵ Expert Report of Allen Ferrell, Ph.D. at C-1.

¹⁰⁶ Expert Report of Allen Ferrell, Ph.D. at C-6.

¹⁰⁷ Expert Report of Allen Ferrell, Ph.D. at 65.

long-run effect on liquidity and prices as Ripple itself stated and planned: “*over time* we expect to see *an increase in demand for XRP that more than offsets the additional supply* we inject into the market (emphasis added).”¹⁰⁸ In other words, Ripple executives recognized that selling shares might depress shares in the short-term—an impact that they tried to minimize, as discussed earlier— but that such efforts would be beneficial to the price of XRP “over time.” According to Ripple, the intended effect of XRP distributions is to “incentivize actions that *build*...liquidity in the network” which should lead to “an increase in demand for XRP” and “*strengthening XRP exchange rate*.”¹⁰⁹ Yet, unlike the statements from Ripple, Professor Ferrell’s regression analysis is not focused on the long-term effects of Ripples XRP distributions but is rather focused only on the contemporaneous impact.

¹⁰⁸ Re: XRP Bulk Purchase. (██████████_Ripple_0002422).

¹⁰⁹ *ibid.*

Executed November 12, 2021



 Ph.D.

IV. APPENDIX A: CURRICULUM VITAE

[REDACTED]

[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]
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[REDACTED]

[REDACTED]

[REDACTED]

V. APPENDIX B: RECENT TESTIMONY AND COURT-FILED EXPERT REPORTS

Testimony in the last four years and court-filed expert reports

Case Name: [REDACTED]
Case No.: [REDACTED]
Date: [REDACTED] (Report), [REDACTED] (Deposition), [REDACTED] (Report)

Case Name: [REDACTED]
Case No.: [REDACTED]
Date: [REDACTED] (Report)

VI. APPENDIX C: LIST OF DOCUMENTS RELIED UPON

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[REDACTED]

[REDACTED] Market Making Agreement, March 31, 2014. RPLI_SEC 0947000.

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VII. APPENDIX D: TOP 100 RETAILERS

The table below lists the top 100 retail companies ranked by 2020 US sales, as estimated by Kantar Group for the National Retail Federation.¹¹⁰ It excludes restaurants, and the listed dollar amounts are each company's worldwide retail-exclusive sales.

Rank	Company	2020 Retail Sales (billions)	Rank	Company	2021 Retail Sales (billions)
1	Walmart	\$430.82	51	WinCo Foods	\$8.74
2	Amazon.com	\$187.27	52	Good Neighbor Pharmacy	\$8.45
3	The Kroger Co.	\$131.57	53	Southeastern Grocers (BI-LO)	\$8.23
4	The Home Depot	\$121.26	54	Army & Air Force Exchange	\$7.90
5	Costco Wholesale	\$121.22	55	J.C. Penney Company	\$7.48
6	Walgreens Boots Alliance	\$104.70	56	Save-A-Lot	\$7.25
7	Target	\$92.40	57	Bass Pro	\$6.80
8	CVS Health Corporation	\$89.53	58	Staples	\$6.63
9	Lowe's Companies	\$82.88	59	Williams-Sonoma	\$6.61
10	Albertsons Companies	\$69.73	60	Sprouts Farmers Market	\$6.45
11	Apple Stores / iTunes	\$55.06	61	Speedway	\$6.38

¹¹⁰ National Retail Federation. Top 100 Retailers 2021 List. <https://nrf.com/resources/top-retailers/top-100-retailers/top-100-retailers-2021-list>.

12	Royal Ahold Delhaize USA	\$51.17	62	AVB Brandsource	\$6.28
13	Publix Super Markets	\$44.84	63	Big Lots	\$6.20
14	Best Buy	\$43.24	64	Ulta Salon, Cosmetics & Fragrance	\$6.15
15	Aldi	\$34.54	65	Foot Locker	\$6.03
16	Dollar General	\$33.74	66	Ikea North American Services	\$5.91
17	H.E. Butt Grocery	\$29.01	67	Office Depot	\$5.78
18	TJX Companies	\$25.17	68	Academy Sports	\$5.69
19	Dollar Tree	\$25.08	69	Burlington	\$5.63
20	Ace Hardware	\$22.69	70	Camping World	\$5.45
21	Meijer	\$19.59	71	Discount Tire	\$5.15
22	Wakefern / ShopRite	\$18.27	72	Sephora (LVMH)	\$5.01
23	7-Eleven	\$18.25	73	Piggly Wiggly	\$4.85
24	Macy's	\$17.15	74	Hobby Lobby Stores	\$4.79
25	AT&T Wireless	\$17.02	75	Petco	\$4.78

26	Rite Aid	\$16.37	76	Michaels Stores	\$4.76
27	Verizon Wireless	\$15.49	77	Stater Bros Holdings	\$4.68
28	BJ's Wholesale Club	\$15.43	78	Signet Jewelers	\$4.65
29	Kohl's	\$15.33	79	Exxon Mobile Corporation	\$4.63
30	PetSmart	\$13.18	80	Defense Commissary Agency	\$4.60
31	Menards	\$12.80	81	My Demoulas	\$4.55
32	Ross Stores	\$12.51	82	Advance Auto	\$4.35
33	Dell Technologies	\$12.31	83	Dillard's	\$4.16
34	Hy Vee	\$11.97	84	Smart & Final	\$4.12
35	Wayfair	\$11.61	85	Weis Markets	\$4.11
36	O'Reilly Auto Parts	\$11.60	86	Ingles	\$4.02
37	Gap	\$11.51	87	Golub	\$3.91
38	Qurate Retail	\$11.21	88	Shell Oil Company	\$3.88
39	Health Made Systems	\$10.94	89	Save Mart	\$3.86

40	Wegmans Food Market	\$10.84	90	Total Wine & More	\$3.82
41	L Brands	\$10.80	91	Caseys General Store	\$3.72
42	AutoZone	\$10.70	92	Guitar Center	\$3.43
43	True Value Co.	\$10.60	93	GameStop	\$3.40
44	Tractor Supply Co.	\$10.57	94	American Eagle	\$3.33
45	Giant Eagle	\$9.97	95	UNFI	\$3.17
46	Alimentation Couche-Tard	\$9.95	96	Grocery Outlet	\$3.13
47	Dick's Sporting Goods	\$9.57	97	Belk	\$3.13
48	Sherwin-Williams	\$9.40	98	Lululemon	\$3.04
49	Nordstrom	\$9.35	99	Sears Holdings	\$3.03
50	Bed Bath & Beyond	\$8.91	100	AMPM	\$3.00

VIII. APPENDIX E: ANALYZED PURPORTED “USE CASES” FROM APPENDIX C OF ADRIAENS REPORT

The table below presents a filtered list of purported “use cases” as identified in Appendix C of the Adriaens Report. A qualitative filter was applied to remove any “use cases” that pertain to digital asset platform trading, payment services, lending and investments, wallet applications, casino/gambling, and those that could not be accessed online or appear to no longer be an operating domain as of the date of this report. All details listed below including Entity Name, Category, and Website are copied as is from Appendix C of Adriaens Report.

List of XRP “Use Cases”		
Entity Name	Category	Website
2sync	Hosting Provider	https://www.2sync.co/
AGRsicurezza	Consultancy	https://www.agrsicurezza.it/
AirVPN	VPN Hosting	https://airvpn.org/
Alphacat	Robo-advisor Marketplace	https://alphacat.io/
Alquicoche	Rental car booking site	https://www.alquicoche.es/
Alternative Airlines	Air travel booking site	https://www.alternativeairlines.com/
AMLBOT	AML support	https://amlbot.com/#~np1
Antalya Homes	Real Estate	https://www.antalyahomes.com/
As You Wish Bodywork LTD	Massage	https://www.messagebook.com/Denver~Massage~AsYouWishBodywork?utm_source=cryptwerk
AsiaMTM Group	Manufacturing, Trading, Marketing	https://asiamtm.com/
Autohaus-seidl.at	Physical car dealer	https://www.autohaus-seidl.at/
BCHLX	Blockchain applications	https://bchlX.com/
Beachhead	Game	https://beachhead.com/
Beliani	Furniture	https://www.beliani.co.uk/
Beschriftungsprofi	Marketing services (lettering, etc.)	https://www.beschriftungsprofi.at/
Bidali	Purchase/Gift Card	https://www.bidali.com/
Bitcoin.travel	Travel booking site	https://bitcoin.travel/
Bitgild	Precious metals Marketplace	https://www.bitgild.com/
BitStickers	Marketplace	https://bitstickers.net/
Blockdaemon	Networking	https://blockdaemon.com/
Bluzelle	Technology	https://bluzelle.com/
Boatsters Black	Yachts for Charter	https://boatstersblack.com/
BookcoinShop	Marketplace	https://bookcoinshop.com/
Booking.com	Hotel booking site	https://www.booking.com/
BookMauritiusHotels	Hotel Booking	https://www.bookmauritiushotels.com/
Bravsy	Travel agency	https://bravsy.com/
Bronn Travel	Travel Agency	https://bronntravel.com.ua/
Bullion79	Precious metals Marketplace	https://bullion79.com/
BuyWithCoins	Marketplace	https://www.buywithcoins.online/

List of XRP "Use Cases"		
Celtic Gold	Precious metals Marketplace	https://www.celticgold.eu/en/
Chainalysis	Blockchain Analysis	https://www.chainalysis.com/
Club Turismo	Travel agency	https://www.clubeturismo.com.br/
Coin Monster Store	Purchase/Fashion Apparel	https://coinmonster.store/
Creative Click	Video/animation Productions	https://www.creativeclick.co/
Crypto Coffee	Marketplace	https://crypto-coffee.com/
Crypto Cove	Purchase/Fashion Apparel	https://cryptocove.io/
Crypto Emporium	Purchase/Fashion Apparel, Cars, Electronics	https://cryptoemporium.eu
Crypto Posters	Poster store	https://www.cryptocurrencyposters.com/
Crypto Shopper	Purchase/Fashion Apparel	https://cryptoshopper.store/
Crypto Voucher	Buy vouchers	https://cryptovoucher.io/
Crypto Whale Clothing	Marketplace	https://cryptowhaleclothing.com/
Cryptoholic Shop	Purchase/Fashion Apparel	https://www.cryptoholicshop.com
Cryptojaunt	Travel Booking Platform	https://www.cryptojaunt.com/
Cryptopet	Marketplace	http://cryptopet.com/
Cryptosa	Advisory Firm	https://cryptosa.org/
Delphin hotel	Hotel	https://delphinhotel.com/
DEV	Online community	https://dev.to/
Diaz Plasencia y Asociados	Legal services	http://diazplasencia.com/
Digitec	Marketplace	https://www.digitec.ch/
Do You Space	Architecture firm	http://www.doyouspace.net/about-3/
Dokter Online	Online pharmacy	https://www.dokteronline.com/en/
Dynasty Goddess Hair	Hair extension shop	https://www.dynastygoddess.com/
Eat Me Clothing	Purchase/Fashion Apparel	https://eatmeclothing.com/
Ecstatic	Purchase/Fashion Apparel	https://ecstaticstore.com/
Ecwid	E-commerce hosting	https://www.ecwid.com/
eGifter	Purchase/Gift Card	https://www.egifter.com/buy-gift-cards-with-xrp
EnterBillions	Spam Blocker	https://enterbillions.co/
Evident Proof	Data Verification/Proof Service	https://evident-proof.com/
Expedia	Travel booking site	www.expedia.com
Extrutherm	Construction services	http://www.extrutherm.at/2018/
FAMprint	Printing	https://www.fam-print.ch/
Fetch Portraits	Photographer	https://www.fetchportraits.com/
FinFreeOTC	P2P Cryptocurrency Marketplace	https://finfreeotc.com/
Frank and Beans	Purchase/Fashion Apparel	https://www.frankandbeans.com.au/
Galaxus	Marketplace	https://www.galaxus.ch/
Game Servers Today	Game server hosting	https://gameservers.today/
Gas Aces	Gas and heat repairs	https://www.gasaces.com/

List of XRP "Use Cases"		
GBI	Bullion store	https://www.bullioninternational.com/
Giacobbe & Co.	Jewelery	https://giacobbeandco.com/
Glance Bay Luxury Shuttle	Rental car company	https://hankcooper.com/shuttle
GoLance (ODL)	Online Workforce Platform	https://golance.com/
Greitai	Travel booking site	https://www.greitai.lt/
Grupo Terramovil del Mediterraneo SL	Car dealer	https://criptocoches.com/
Harmonie im Garten	Garden goods	https://www.harmonie-im-garten.at/
Hauer 1a	Contractor	https://www.hauer1a.at/
Haus Irene	Accommodations	https://www.ferienwohnungen-irene.de/
Henley Audio	A/V services for events	https://henleyaudio.com/
Hide.me	VPN	https://hide.me/en/
Hosteria Encantó del Lolog	Accommodations	https://encantodellog.com/
Hostiso	Hosting Provider	https://hostiso.com/
Hostsailer	Technology	https://hostsailor.com/how-to-pay-with-cryptocurrencies/
Hostwinds	Web Hosting Provider	https://www.hostwinds.com/
Hotel Ploberger	Accommodations	https://www.hotel-ploberger.at/de/
Hotel Vienna	Accommodations	https://www.hotelvienna.at/
Indybudmarv2	3D printing and design	https://www.budmarv2.com/
itlawyers.gr LLC	Legal services	https://www.itlawyers.gr/
KAZARTT	Purchase/Fashion Apparel	https://www.kazartt.com/
Keyless Technologies	Authentication software	https://keyless.io/
Keys4coins	Marketplace	https://www.keys4coins.com/
KinkyBoots & Bits	Purchase/Fashion Apparel	https://www.kinkyboots.com.au/
Kristina Rybaltchenko	Purchase/Fashion Apparel	https://rybaltchenko.com/
Kryptohotel Vienna	Accommodations	https://www.kryptohotel.at/
Kun Koro	Counseling	https://kunkoro.kiwi/indexeng.html#
Laferla	Insurance company	https://www.laferla.com.mt/
Lord	Purchase/Fashion Apparel	https://www.lord.gr/en/
Mader Reisen	Travel agency	https://www.maderreisen.at/Home/
Marketing Empire	Digital Marketing Agency	https://marketingempire.co.uk/
Mental Market	Marketplace	http://mentalmarketing.com/
Mileata	Watch manufacturer	https://mileata.com/
Mopesa Car Rental	Rental car service	https://www.facebook.com/mopesacarrentalkoronadal/
NordVPN	Technology	https://nordvpn.com/
OffshoreDedicated	Hosting Provider	https://offshorededicated.net/
Omgserv	Minecraft Server	https://www.omgserve.com/en/

List of XRP "Use Cases"		
Omni Projects	Software	omnigroup.com
Opu Labs	Healthcare e-commerce	https://www.opulabs.com/
PexPeppers	Marketplace	https://pexpeppers.com/
PPC Protect	Fraud Prevention	https://ppcprotect.com/
PrestigeTime	Online luxury watch store	https://www.prestigetime.com/
Print Ted	Purchase/Fashion Apparel	https://print-ted.com/
Propy	Marketplace	https://propy.com/browse/
Qeeq	Rental car service	https://www.qeeq.com/
Quantoz (Nexus)	Transaction processing	https://quantoz.com/solutions/cryptocurrency-services/
R3	Software	https://www.r3.com/
Refundo	Tax refund	https://refundo.com/
Rights	Digital Market	https://rights-dapp.io/
Search Candy	Digital Marketing	https://www.searchcandy.uk/
Selly	E-Commerce	https://selly.io/
Sesocio	Investment platform	https://sesocio.com.ar/
Shopify	Marketplace	https://www.shopify.com/
Snel.com	Technology	https://www.snel.com/
Sologenic	Tokenization	https://www.sologenic.com/
Soulful Essence	Marketplace	https://soulfulessence.com/
SSL Dragon	SSL Certificate Marketplace	https://www.ssldragon.com/
Standing Ovation	Event Service Provider	https://standingovation.ch/en/
Starting Point Mental Health	Therapy	https://www.therapydelandfl.com/
Stats Autos Spa	Auto detailing	https://stats-auto-spa.com/
Staxe	Tokenization	https://staxe.io/
STYRA Technologies	Interledger gateway provider	https://www.styra.com/
SubscribeStar	Crowdfunding	https://www.subscribestar.com/
Suisse Gold	Precious metals Marketplace	https://www.suissegold.eu/en/
Swiss Crypto Vault	Crypto storage	https://swisscryptovault.ch/
Talizi Hair Transplantation Clinic	Hair transplants	https://tsilosani.com/en/
TapJets	Travel	https://www.tapjets.com/
Tegiwa	Imports	https://www.tegiwaimports.com/
ti&m	IT service provider	https://www.ti8m.com/
TMD STUDIO LTD.	Architecture	https://www.tmd.studio/
Toca Coffee	Marketplace	https://www.tocacoffee.com/
TorGuard	Technology	https://torguard.net
Trachtenhans	Purchase/Fashion Apparel	https://www.trachtenhans.com/
Transfer4cheap	Travel	https://www.transfer4cheap.com/en
Travala	Purchase/Travel	https://www.travala.com/payment/xrp

List of XRP "Use Cases"		
Travolier Hoteliermart	Loyalty program	https://travolier.com/
Tron Network Store	Merchandise store	https://tronnetwork.store/
TruViewz	Photographer	https://truviewz.com/
Utimez	Web Design	https://ultimez.com/
Unicef	Charity	https://www.unicef.fr/
Upvotes Club	Marketplace	https://upvotes.club/
Varle.It	Online marketplace	https://www.varle.it/
VeePN	VPN	https://veepn.com/
ViaBTC	Cryptocurrency mining service	https://www.viabtc.com/
Victory Rentals	Outdoor equipment rental	https://www.victory-rentals.com/
Villa Eros Apartments	Accommodations	https://villa-eros.weebly.com/
Volkskraftwerk	Energy technology	https://www.volkskraftwerk.com/
Vontobel Investment Banking	Wealth management, active asset management and investment solutions	https://www.vontobel.com/en-int/
W.Hamond	Jewelry Store	https://whamond.com/
WeMakePrice	Mall	https://front.wemakeprice.com/main
Winipple	Purchase/Fashion Apparel	https://winipple.com/shop/
WooCommerce	E-commerce hosting	https://woocommerce.com/
Wrecky Car Wreckers	Towing service	https://www.wrecky.com.au/
XcelTrip	Travel booking site	https://www.xceltrip.com/
xCryptoCrash	Gambling site	https://xcryptocrash.com/
Yacht Break	Yacht Charter	https://theyachtbreak.com/
Zwei Fach Vertriebs GmbH	Interior decorating	https://www.zwei-fach.at/